

added to the heated HPMC solution and stirred at high RPM for about 20 min. The HPMC solution was filtered through a 40  $\mu\text{m}$ /70  $\mu\text{m}$  (absolute/nominal) Cuno Betapure filter to remove undissolved gels and particulates. Next a stock solution of Zonyl® FSO-100 was prepared. More specifically, 10 g of Zonyl® FSO 100 were added to 92.61 mL of water and heated until the Zonyl® FSO 100 was fully dissolved. The necessary amount of HPMC stock solution to make about 0.08% wt. HPMC solution in the final ink composition was placed in a container. Then, the necessary amount of Di water to make about 99.555% wt. water solution in the final ink composition was added. The solution was stirred for about 15 min. and the necessary amount of silver nanowires to make about 0.36% Ag nanowire solution in the final ink composition were added. Finally, the necessary amount of the Zonyl® FSO-100 stock solution to make about 0.005% wt. Zonyl® FSO-100 solution was added.

**[0275]** All of the above U.S. patents, U.S. patent application publications, U.S. patent applications, foreign patents, foreign patent applications and non-patent publications referred to in this specification and/or listed in the Application Data Sheet, are incorporated herein by reference, in their entirety.

**[0276]** From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

1. A method of fabricating a transparent conductor comprising:

depositing a plurality of metal nanowires on a surface of a substrate, the metal nanowires being dispersed in a liquid; and

forming a metal nanowire network layer on the substrate by allowing the liquid to dry.

2. The method of claim 1 wherein the metal nanowires are silver nanowires.

3. The method of claim 1 wherein the liquid further comprises an additive selected from carboxy methyl cellulose, 2-hydroxy ethyl cellulose, hydroxy propyl methyl cellulose, methyl cellulose, poly vinyl alcohol, tripropylene glycol, and xanthan gum.

4. The method of claim 1 further comprising pre-treating the surface of the substrate prior to depositing the metal nanowires.

5. The method of claim 4 wherein pre-treating the surface of the substrate creates a pattern comprising at least one pre-treated region and at least one untreated region.

6. The method of claim 5 wherein the metal nanowire network layer is only formed on the pre-treated region.

7. The method of claim 4 wherein pre-treating the surface includes depositing an intermediate layer on the surface of the substrate, plasma treatment, UV-ozone treatment, or corona discharge

8. The method of claim 1 further comprising post-treating the metal nanowire network layer.

9. The method of claim 8 comprising applying pressure, heat or combination thereof to the metal nanowire network layer.

10. The method of claim 8, wherein post-treating the metal nanowire network layer increases the conductivity thereof.

11. The method of claim 1 further comprising:

depositing a matrix material on the metal nanowire network layer; and

curing the matrix material to form a matrix, the matrix and the metal nanowires embedded therein forming a conductive layer.

12. The method of claim 11 further comprising:

causing at least a section of each of a portion of the plurality of metal nanowires to protrude above a surface of the matrix to provide a conducting surface of the conductive layer.

13. The method of claim 11 wherein the matrix material comprises a polymer dispersed in a solvent.

14. The method of claim 11 wherein curing comprises evaporating the solvent.

15. The method of claim 11 wherein the matrix material comprises a prepolymer.

16. The method of claim 15 wherein the prepolymer is photo-curable.

17. The method of claim 15 wherein the prepolymer is thermal-curable.

18. The method of claim 11 wherein the matrix material is deposited according to a pattern, providing coated regions and uncoated regions of the metal nanowire network layer, the coated regions curing into a patterned matrix.

19. The method of claim 18 further comprising removing the metal nanowires in the uncoated regions.

20. The method of claim 18 wherein the matrix material is printed on the substrate according to the pattern.

21. The method of claim 11 wherein curing comprises selectively curing, according to a pattern, the matrix material to form cured regions and uncured regions.

22. The method of claim 21 further comprising removing the matrix material and the metal nanowires in the uncured regions.

23. The method of claim 21 wherein the cured regions form patterned conductive layers.

24. The method of claim 1 wherein the substrate is flexible.

25. The method of claim 24 wherein the substrate is driven by a rotating reel along a traveling path, and the metal nanowires are deposited at a first deposition station along the traveling path, and the matrix material is deposited at a second deposition station along the traveling path.

26. The method of claim 25 wherein the substrate is positioned on a conveyor belt.

27. The method of claim 25 further comprises curing the matrix material at a patterning station along the traveling path.

28. The method of claim 27 wherein curing comprises continuously exposing the matrix material to light irradiation.

29. The method of claim 28 wherein the light irradiation is projected to the matrix material according to a pattern.

30. The method of claim 27 wherein curing comprises heating the matrix material layer according to a pattern using a heat insulating mask.

31. The method of claim 27 wherein the matrix material is patterned into cured regions and uncured regions.

32. The method of claim 31 further comprising removing the matrix material and the metal nanowires in the uncured region.

33. The method of claim 1 wherein the substrate is a flexible donor substrate.